LECTURES
ON THE
PRINCIPLES OF SURGICAL DIAGNOSIS:
ESPECIALLY IN RELATION TO SHOCK AND
VISCERAL LESIONS.

Delivered at the Royal College of Surgeons of England.

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LECTURE V.—LESIONS OF THE ABDOMEN (CONTINUED).

Injuries Involving the Abdominal Viscera Generally.—Symptoms: Collapse; Tympanites; Vomiting; Suppression or Retention of Urine; Temperature; Hemorrhage; Pain; Peritonitis.—Rupture of Particular Viscera, Membranous and Solid.—Penetrating Wounds Involving Different Viscera.—Traumatic Cyst in Abdomen.—Fluctuation.—Consequences of Injury to Chest and Abdomen Compared.

MR. PRESIDENT AND GENTLEMEN,—The diagnosis of wounds penetrating the peritoneum is rarely a matter of difficulty or doubt. The protrusion of any portion of the visceral contents is conclusive. But, even apart from this demonstrative evidence, the nature of the wound and the mode of its infliction generally indicate whether the abdominal wall has been entirely penetrated. Yet, in some instances this circumstance is doubtful; and, if so, the welfare of the patient forbids any inquisitive attempt to solve the doubt; unless, indeed, the suspected presence of any foreign body prompt the surgeon to seek for, with a view of removing, it. Such doubt existed in the case of gun-shot wound which I mentioned in my last Lecture; and a similar difficulty existed in an instance of self-inflicted mutilation which was under my care. The patient to whom I refer had stabbed or cut himself across the abdomen, and remained for some time in a precarious state, but ultimately recovered. The far more important inquiry, and one which it is often both necessary and judicious to leave in abeyance is, whether any viscus is implicated in the injury. As the consideration of wounds, attended by simple protrusion of the abdominal contents, is unnecessary so far as diagnosis is concerned, I will now proceed to make some remarks on traumatic lesions, from various causes, of individual viscera.

Every organ within the abdomen may be the subject of wound or laceration; and these injuries may result from compression, by which they are ruptured, or they may be caused by cutting or pointed instruments, or penetrating missiles. Thus, these lesions resolve themselves into such as occur without external wound, and those which are the sequence of an injury implicating some part of the abdominal wall. It may be convenient to consider those separately; although, as regards the diagnostic symptoms by which they may be identified, they belong essentially to the same category.

I have already remarked that no dependence is to be placed on shock as an index of visceral lesion: and I may here observe further, that depressed temperature at an early period is no reliable guide; but it is to be interpreted simply as a measure of the severity of the shock, without reference to the complication of organic lesion. The shock, indeed, in abdominal injury is proportioned entirely to the impression made on the ganglionic nerve-centres; simple visceral lesion, unaccompanied by any great violence, is not necessarily attended by symptoms of collapse, primarily; and the absence of the usual indications which manifest this state, may thus be very deceptive during the early stage of such cases. But the subsequent and sudden supervention of these symptoms derives a significance from the delay, and, in most instances, admits but one interpretation, viz: that extravasation of foreign matter of an irritating quality has occurred, and carried, through the sensitive serous membrane, that deleterious effect and consequent impression on the ganglionic nerves, which the simple laceration of the viscus had failed to produce.

I may take this opportunity of remarking, also, that the temperature in abdominal lesions appears to be more uniformly low than in head injuries; and the chief feature seems to be the steady fall in the temperature after the injury, lasting for a greater length of time in the former than in the latter, before reaction ensues. So far as the cases examined justify the conclusion, the temperature varies directly with the amount of injury received; primarily indicating the intensity of the

shock, and subsequently the severity and fatal character of the visceral injury.

In many respects, for purposes of diagnosis, organic injury of the abdominal viscera, whether as the consequence of a penetrating wound or of rupture, may be regarded as identical. The usually fatal character of these lesions, and the causes of that fatality, are the same in both cases, though occurring under different circumstances. But it is the circumstances in question which render it desirable to notice these several forms of injury separately; inasmuch as the manner of their infliction is, in the one case, often presumptive proof of the nature of the lesion; whereas, in the other, no such conclusion can be drawn from the same source of evidence. It is often a matter of pure speculation, when the abdomen has been forcibly compressed or violently struck, what viscus is injured, even when the symptoms are of a nature which leaves little or no doubt of the existence of some organic lesion. Certainly the mode in which the force was applied, and the spot which chiefly experienced its violence, rarely suffice to clear up this doubt, if unaided by any local sign of mischief. The remarkable variety of injury that is met with, under apparently similar circumstances, is often difficult to account for, especially in regard to the solid viscera. The actual state of the membranous viscera, as regards repletion, often determines their rupture, and thus affords a clue to a probable diagnosis, which other symptoms may serve to confirm. This remark applies especially to the stomach, duodenum, and urinary bladder; and in a minor degree to other parts of the intestinal canal.

It is probable that many structural lesions of the solid organs of the abdomen are healed, without our being able to form more than a conjectural conclusion that such a serious injury had been inflicted; but this is very rarely the case with the membranous viscera: speedy fatality in these cases is the rule, and recovery the rare exception.

Yet, it is not to be inferred, as I have already observed, that the breach in the texture of the organ is, in itself, mortal or irrecoverable. We know, indeed, that the colon, and even the stomach, may be opened, without producing any marked constitutional or general disturbance; but, immediately the contents of any membranous viscus are diffused in the peritoneum, the symptoms of mortal shock succeed, and the patient sinks at once under its prostrating influence, or survives just long enough for peritonitis to have a share in determining the fatal issue.

The difference, as regards fatality, between penetrating wounds and rupture of a membranous viscus, is certainly in favour of the former; for the lesion may be of a character—say a puncture—which admits of repair, without extravasation of the contained matter; and we know that the construction and organisation of a musculo-membranous sac or canal is by no means unfavourable to repair; but that, under propitious circumstances, a ready activity and varied resource is manifested; and that security is thus often acquired in an unexpectedly brief period: even the products of inflammation which autopsies betray are proof of the unavailing and wasted effort to heal a hopeless breach. But in rupture, from pressure however exerted, the rent, from its nature and extent, is usually of a character that does not admit of repair; and, moreover, the frequent determining cause, as regards locality, viz: more often, ensures a speedy extravasation of the matters contained within the torn viscus.

For obvious reasons, the Hospital Surgeon, in civil practice, meets more frequently with visceral lesions from rupture than from penetrating wounds; and he is, therefore, more often called upon to form his diagnosis, where he has but little to guide him beyond the general symptoms of his patient. Fortunately his decision can have but little influence on the result, in that it is impossible for him, in most instances, to affirm at an early period, whether such lesion exist or not; and his practice should, in doubtful cases, be conducted on the assumption that some organic injury may be present.

In illustration of the difficulties attending the diagnosis of these injuries, I will narrate a hospital case which came under my care, whilst engaged in writing these remarks: it is simply typical of a class which is of frequent occurrence in hospital practice.

A boy, nine years of age, was knocked down and run over by a butcher's cart, the horse, it was said, treading upon his belly. I saw him about an hour after his admission, and found him in a state of profound collapse. The surface was cold, the temperature being little more than 97 deg.; pulse rapid, and scarcely perceptible; tendency to sickness; respiration rapid and jerking; intense thirst. By this time, the abdomen had become tympanitic all over, the parietes being tense from the epigastrium downwards; there was much tenderness, especially just below the umbilicus and in the right hypochondrium. The boy had taken his breakfast of bread and milk a short time previously to the accident. I should remark that the back was also contused by the wheel of the cart.

I did not attach importance to the collapse in this case, as an isolated

symptom; but, in association with the manner in which the accident occurred, the distended stomach, the rapidly tympanitic state of the belly, the thirst and nausea, and the pain, I was disposed to regard the case with anxiety, and suspected that I had to deal with a ruptured stomach or duodenum. The introduction of a catheter proved that the bladder was not implicated, as limpid urine was readily drawn off. Reaction was gradual. The boy was starved for two or three days, and then allowed only a little bread and milk. The tympanites subsided, but the bowels remained perfectly inactive, and there was no power to evacuate the bladder. The same points in the abdomen continued very tender on the sixth day. The bowels were permitted to remain unmoved for a week, and were then relieved by an injection; after which he was allowed more food. About this time, also, he began to recover voluntary power over the bladder. This boy continued in the hospital for a little time subsequently, during which he still complained of tenderness in the parts first especially affected.

In the early stage, then, of injury to the abdomen of the character which I have described, it may be affirmed that, in most instances, it is unsafe to venture on a diagnosis of the nature of the hurt, or to predict its probable issue. The absence of shock immediately succeeding a mortal lesion may, as I have already remarked, lull suspicion, as its presence may, in simple contusion, excite alarm; for, if the violence have been insufficient to impress the ganglionic centres, and yet, from special circumstances of a mechanical nature, visceral rupture have been produced, the symptoms of prostration may be deferred until extravasation of the visceral contents has taken place. And it must be always borne in mind that laceration may be of such limited extent or so placed, that, under favourable circumstances, a patient may be on the way to recovery; and any relaxation of the requisite watchful and expectant treatment may be fatal. I shall have the opportunity of exemplifying this remark presently, in a case of penetrating wound. It was this impulse to exercise caution, which induced me to persist in the treatment by abstinence and rest of bowel for so long in the foregoing case.

But, usually, the lapse of a few hours enables the surgeon to speak more positively, where actual lesion of a membranous viscus is present. The suffering of the patient becomes intensified as some vascular reaction takes place; this may be localised, but more often extends over the whole abdomen; the features and general aspect, instead of presenting the comparatively passive expression of simple collapse, are pinched, anxious, and distorted with pain; vomiting and tympanites ensue, if not already present; and the patient may then pass into a state of secondary collapse more profound than at first, or linger on for an uncertain interval in anguish more or less acute, until exhaustion closes the scene by death.

It is commonly said that patients, under these circumstances, die of peritonitis: yet this is scarcely correct. Inflammation here, as in other traumatic lesions, is simply an effort in the direction of repair; and the products of this action are a measure of the activity of the effort, which is not in itself destructive. The patient dies during this stage, it is true; but he succumbs to the shock that is perpetuated by the presence of irritating matter in contact with the peritoneum, and which thus acts upon the ganglionic nerve-centres.

I have generally regarded the period at which *tympanites* occurs as a valuable, though by no means a decisive, guide, in the diagnosis of membranous visceral lesion, as distinguished from simple contusion. In the latter injury, accompanied by shock, tympanites is generally deferred for twenty-four hours; in organic lesion, it is earlier in its appearance. But this is by no means invariable, and is, therefore, not to be trusted by itself as a diagnostic sign; indeed, its early appearance is sometimes simply significant of the intensity of the shock, as exemplified in the instance just now recorded.

What is this tympanites, and how is it produced? In wound of stomach or intestine air may, no doubt, be extravasated into the peritoneum, of which I have some recorded cases; or its presence in the same position may be subsequently accounted for by the disengagement of gas from decomposition. In shock, I regard it as chiefly intra-intestinal, and dependent on the atonic or paralysed condition of the bowel, by which both the generation and accumulation of gas are favoured; for the secreting function and motor power of the intestinal canal are both under the control of the cyclo-ganglionic system: and the failing control of these nerve-centres is witnessed in the tumid belly which denotes progressive organic death in many diseases. The rapid generation and speedy subsidence of tympanites, under some circumstances, are remarkable facts, and are suggestive of the gas being derived from the circulation, and accumulating in the peritoneum—containing, probably, in solution, a considerable portion of watery vapour produced at a heightened temperature; and the fact that a rigid contraction of the abdominal muscles, sometimes noticed in these cases, controls or prevents tympanites, would seem to favour this conjecture.

I have certainly noticed the subsidence of tympanites without, so far as the patient's testimony could be relied on, the escape of gas from the bowel. In abdominal shock, indeed, entire inaction of the intestine is usual for a considerable period—a condition which it is injudicious to disturb. And how often is the converse condition noticed in other affections, viz.: frequent diarrhoea, with persistent tympanites. Whether this capability of exhaling gas be not, under certain conditions, a normal attribute of serous membranes admits of experimental inquiry; and I hope to pursue this subject, in which I have already been engaged, now that more leisure time will be at my disposal. I am not indisposed to think that such a property may subserve important physiological purposes.

Vomiting, as I have already noticed, is by no means an invariable or even ordinary concomitant of contusion, though a sense of nausea is common. But, in ruptured stomach or intestine, the effort of retching is usual, and blood may be thrown up or passed by the bowel.

Suppressed or scanty secretion of urine is usual in organic lesion of the abdominal viscera. But I have already remarked that this sign is present in simple shock, and its continuance may, therefore, be regarded as indicative of the persistence of collapse. *Retention of urine* is not, by itself, demonstrative of anything but disturbed nerve-influence; for it is met with under various circumstances in which the voluntary motor power is implicated, either directly or by sympathy, in an injury; it may be present alike in severe shock and in organic lesion.

As regards *temperature*, I cannot say I have been fortunate enough to obtain any results which satisfy me of its value in determining the presence of visceral lesion, and still less the locality of that lesion. Of the fact that the temperature is depressed in these injuries, as well as in contusion, there can be no doubt; but I have not succeeded in verifying, from my own observation, the remarks of the writer of an article on "*Animal Heat in Surgical Diseases*," in the *Nouveau Dictionnaire de Médecine et de Chirurgie pratiques*, viz.: that the depression of temperature is in proportion to the proximity of the lesion, be it from internal strangulation or other cause, to the stomach. Certainly the intensity of the shock seems to bear a direct ratio to this relation; and, inasmuch as depressed vitality is accompanied by a proportionate degradation of temperature, in this way the observation referred to may be explained. I shall, probably, notice this subject again in my next lecture, where it will find more appropriate illustration.

The manner in which rupture of an abdominal viscus is produced is insufficient, as I have already remarked, to determine the locality of the injury, or even its extent. It may be the result of direct pressure, as between the buffers of two railway carriages; or it may be consequent on some peculiar twist of the body, when it is doubled up, as in falling from a height. In looking through and collating many hospital cases, I am unable to associate the special lesion with any particular form of accident. The violence or pressure seems to be uniformly distributed through the viscera, and some accidental circumstance determines the seat of injury. Even the kidney is not an exception to this remark; for I have found it lacerated under various circumstances, and from different accidents; though, probably, more frequently from a doubling of the body, than the other abdominal viscera.

A singular exception to this remark occurred in a case of which I preserved a record at the time. A large fibro-osseous tumour was shown at the Royal Medical and Chirurgical Society, many years since, by Mr. Arnott, the aged patient from whom it was taken having been killed in a curious way. She was thrown down in the street by a dog, and a fold of small intestine, crossing in front of this tumour, was found ruptured by compression against the abdominal wall.

The occurrence of copious *hæmorrhage* is, for obvious reasons, more likely in rupture of the solid than of the membranous viscera. Usually, indeed, this is the cause of death, where the injury is speedily fatal. In one instance of complicated injury, in a lad, involving liver, spleen, and kidney, I find a record in my note-book that the abdomen was so distended with blood as seriously to compress one lung. The diagnosis of internal hæmorrhage, *plus shock*, is by no means easy. When, to the ordinary symptoms of collapse, great restlessness and distressing thirst are added, with suspension of, or confusion in, the functional activity of the senses, the presence of internal hæmorrhage may be suspected; and this suspicion may be supported by the existence of fulness or dullness over some region of the abdomen, which is likewise the seat of tenderness. The concurrent operation of these two causes may, and does occasionally, prove fatal at an early period, without mortal visceral lesion, or even without any discoverable breach of texture. Thus, I have the record of a *post mortem* examination of a patient who fell from a considerable height, and did not long survive the accident. There was no appearance of external violence, and no visceral lesion; but the right half and transverse meso-colon were distended with blood, as was also a considerable portion of the mesentery; but there was no blood

loose in the peritoneum. Hæmorrhage, combined with shock, proved fatal.

Pain is an uncertain sign by which the nature of an abdominal injury can be judged of: at least, experience has taught me to attach less importance to it than I formerly did. The pain immediately attendant on rupture of a membranous or solid viscus is not necessarily or generally marked or severe, so long as the injury is unaccompanied by the escape of foreign matter into the peritoneal cavity. It has not infrequently happened that patients, on whom this mortal injury has been inflicted, have complained but little at first: but the intense localised suffering which accompanies the subsequent accession of collapse is very suggestive under the circumstances, if not absolutely conclusive, of organic lesion. On the other hand, the most acute pain and tenderness at some particular spot are not infrequently present, where the subsequent history of the case does not admit the supposition that any visceral injury existed. Thus, a mail-cart driver was admitted into hospital under my care, who, in consequence of his horse falling, had been thrown violently on his left side in a bent position. He was in a state of collapse, with a blanched face expressive of great suffering. He writhed in apparent agony, and referred the pain exclusively to the left hypochondrium. His suffering continued, with scarcely any abatement, for two days, and the abdomen became tympanitic. The application of leeches gave relief, and he soon recovered. Another patient under my care had fallen from a high scaffold. In the course of a few hours, when reaction after collapse came on, he began to complain of pain deep in the splenic region, which increased till he rolled about in agony. Opium was given freely and repeatedly; and, after the lapse of about thirty-six hours, the pain had entirely subsided, and he made a quick and good recovery. I should add that this patient passed bloody urine during the continuance of the pain, but not afterwards; and the pain was not aggravated, but considerably relieved, by firm pressure on the part complained of.

I do not pretend to explain the phenomena in such cases as the above, further than to suggest that there may be some analogy between the immediate consequences of mechanical violence to serous and synovial membranes; and that the severe pain of a wrenched joint may have its parallel in the forcible tension, and, possibly, laceration, of the peritoneum.

The continuance of localised pain and tenderness for a considerable period after convalescence has commenced, as in the boy whose case I narrated at an earlier part of this lecture, renders it probable that some trifling organic lesion has existed, which is progressively undergoing repair. I have seen many instances suggesting this explanation.

It must, however, be admitted that acute pain is usually the immediate accompaniment of lesion of a distended membranous viscus, whether stomach or intestine. I have witnessed this condition in many instances where the breach has resulted from violence as well as disease: it is rarely limited to any particular spot, but is rapidly diffused over the whole abdomen. Occasionally I have noticed a lethargic condition, not natural to the patient, succeeding these obscure injuries. It is not an encouraging symptom, but is not associated, apparently, with any special lesion.

In survival for a sufficiently long period, after ruptured stomach or intestine, the reparative effort is indicated by the presence of *peritonitis*. Yet the accession of this condition is rarely attended by any marked change in the condition of the patient, either general or local. The collapse continues, the pain is unabated, though scarcely aggravated, and the force or frequency of the pulse is not materially altered. I may add, the quality and amount of the inflammatory product found after death cannot be measured, so far as I have observed, by the symptoms and signs during life. But the proofs thus afforded of fruitless activity are an encouragement to the surgeon not to relax his efforts, or rather his precautions, even under such adverse circumstances.

The occurrence of a small perforating wound of intestine may, under favouring conditions, be closed by plastic deposit, if the injured part be kept at rest. It is well known that eversion of the mucous membrane, in these circumstances, aids mechanically in the occlusion of the aperture thus made. This preparation (No. 1,179) from the Hunterian Collection exemplifies the condition alluded to. The patient from whom it was taken had fought a duel in Hyde Park, and was shot, on the third exchange of fire, in the abdomen: and Mr. Hunter, who attended him, remarked, with his usual accuracy of observation, that the languidness in the eye made him suspect something more than an ordinary wound. The subject of the injury survived it twenty-four hours. The jejunum was found perforated by a bullet; but this large opening is partially closed by the thickening and eversion of the mucous membrane, and the deposit of plastic lymph. A similar case occurred under my observation in St. Thomas's Hospital, to which I shall have to refer as exemplifying the value of continuous rest under these circumstances.

This preparation (No. 1,180) also illustrates a similar condition of the intestine to that which I have just shown. The injury in this instance was caused by the kick of a horse in the epigastrium, the result of which was a rupture of the jejunum.

When the laceration is extensive, this eversion, accompanied by retraction of the edges, facilitates the escape of feculent matter from the bowel—which I have witnessed in instances both of single and double rupture of the jejunum, of which I have a record.

I have remarked that organic injury of the solid viscera of the abdomen is by no means so fatal as that of the membranous. If the first effects of shock and hæmorrhage are survived, recovery from limited lesion of the liver or kidney are probably not infrequent. I say probably, because, in such cases, the nature of the injury can be only conjectured. Whether the spleen may be placed in the same category I think doubtful, on account of its peculiar texture and vascularity. Such a laceration as is here shown in the *liver* must, from its extent, be necessarily fatal (No. 1,391); it is wonderful, indeed, that the patient, who was crushed, should have survived two days, with a rupture extending completely through the organ. In such cases, profound collapse, with abdominal extravasation, indicates the serious nature of the lesion, without, however, pointing accurately to its site. Many such, though rarely to this extent, have come under my notice. The most extensive injury of the liver which I have on record among my cases, is that of an adult who survived his admittance into the hospital, and in whom a large mass of the crushed right lobe was torn away and thrust to the left side of the abdomen. The right kidney was also broken into several fragments. I may remark that, in superficial lacerations, I have found almost invariably that it is the under surface of the organ that is torn.

Although the time at my disposal does not permit of my illustrating the diagnosis of these injuries so amply as my case-books would permit, I am tempted to relate one instance of hepatic lesion, which is interesting from the protraction of life, and the fluctuation of the symptoms which were presented during the progress of the case.

A drayman, aged 22, was admitted into hospital under my care, having been jammed between the shafts of his dray and the wheel of a van. There was no external appearance of injury; but the collapse, thirst, constant sickness, and severe pain across the epigastrium, suggested the possibility of some serious organic lesion. The urine was drawn off, free from blood. On the third day the symptoms had, for the most part, abated, with the exception of thirst and abdominal pain. On the sixth day he was more feverish and restless; and increased abdominal pain was accompanied by tenderness. The face was jaundiced and anxious. It was evident that diffused peritonitis was commencing. On the eighth day there was abdominal effusion to a moderate extent, but the general condition was improved. During the succeeding week the patient's condition varied, and the effusion into the abdomen was diminished in quantity, and the jaundice had abated. Afterwards increased tenderness ensued, with tympanites; and he at last sank rapidly, and died on the eighteenth day after the accident. On examination, the peritoneal cavity was found to contain a considerable amount of somewhat turbid fluid, coloured with bile. There was a large quantity of soft lymph effused about the surface of the liver, and the serous covering of the intestines was thickened by similar deposit. The peritoneal lining of the anterior wall was rough and congested. The abdominal contents were remarkably free from putridity. The liver, which was large, presented a laceration on its lower surface, passing from the anterior margin backwards, close to and parallel with the gall-bladder. In the posterior part of this wound the right hepatic duct was seen to be torn nearly across at its commencement from the common duct, the left branch being uninjured. The gall-bladder and cystic duct were also entire, but the latter was much contracted. Some pale coagulum lay beneath the serous covering of the right kidney. There was no attempt at repair in the lacerated wound of the liver.

The protraction of life and temporary amendment in many of the symptoms, succeeding so serious a lesion, are unique in my experience, and exemplify the difficulty attending the diagnosis of these injuries.

General peritonitis is not a necessary—I may say, so far as my observation enables me to judge, not even a general—consequence of rupture of the liver. In the record of several of my cases, where the patients have survived some days, I find a memorandum to that effect. Such an injury may be succeeded by abscess, as occurred in a lad under my care who survived his injury nearly three weeks, and then died with symptoms of acute pleuro-pneumony and meningitis. In this instance there was a cavity, containing several ounces of pus, between the diaphragm and liver, and bounded partly by the ascending colon. There was evidence that the right lobe had been ruptured; but even in this case there was no appearance of general peritonitis.

A recurrence of the early symptoms in these suspected lesions, after

convalescence, indicates probably mechanical interference with repair, attended by hæmorrhage. I have met with a few such cases as the following. A patient was the subject of a severe contusion of the side, followed by acute pain in the right hypochondrium, with collapse. On the third day he rallied, and these symptoms subsided, leaving him with a jaundiced skin; when he imprudently got up and made some effort, and suddenly had a recurrence of collapse, accompanied with great tenderness in the hypochondrium. From this relapse he rallied more slowly, and retained his sallow hue for a long time.

Extravasation of blood in the subserous areolar tissue around the kidney, is by no means uncommon, without laceration of the organ; but I apprehend there can be little doubt that lesion of the kidney itself does often occur without proving fatal. Limited bleeding from the kidney is a frequent consequence of contusion or pressure; and, when a transient symptom, proves nothing more than rupture of some vessels which pour their blood into the pelvis of the organ. But when the hæmorrhage is copious and persistent, or recurrent, accompanied by pain, and especially if followed by suppuration, there can be little doubt that a more serious injury has been inflicted. Of this class of cases I have many recorded; but I will refer briefly to only one or two. Thus, a painter, aged 37, was admitted into the hospital under my care, having been struck down and run over by an omnibus, the wheel of which passed across the abdomen in a direction obliquely upwards from the right groin. He was in profound collapse, without pulse, and his eyes were glassy. A catheter was passed, and a small quantity of bloody urine was drawn off. With slight reaction, constant sickness ensued, and much abdominal tenderness. On the fourth day the symptoms were somewhat improved, and blood was no longer mixed with the urine; but, on the following day, blood again appeared; the sickness continued, with intermittent abdominal pain, some distension, and great tenderness. These symptoms remained unabated for two or three days, the tension of the abdomen increasing with perceptible fluctuation; and he was delirious. But a clean, moist tongue encouraged me in adopting a more sustaining plan of treatment, and the patient slowly rallied, the symptoms gradually subsiding, but with occasional relapses; and he was convalescent in six weeks, though still pale and feeble.

In some instances, the blood is in sufficient abundance to clot, after it is withdrawn from the bladder. Sickness is always more or less persistently present in these injuries, and the lumbar pain survives the bleeding. Another symptom which I have noticed in some cases of kidney lesion I cannot account for satisfactorily: it is the presence of dulness on percussion, extending from the hypochondrium to the iliac fossa, and accompanied by tenderness, apparently, in the track of the ureter. It may possibly be due to subserous extravasation of blood.

The following is another case of the same type, but of a more complex character. I was summoned to see a gentleman whose horse had fallen with him in the hunting-field, and had crushed by partly rolling over him. He was carried home in a state of collapse: his suffering, which was severe, was referred to the left hypochondrium and loin. The contents of the bladder, when first withdrawn, appeared to be pure blood; and copious hæmorrhage continued for some days. At the expiration of about a fortnight, pus was substituted for blood, and continued to be mixed with the urine, in gradually diminishing quantities, for more than two months. This patient continued invalided for a long time, but ultimately recovered. One remarkable symptom in his case, and which lasted for some time, was the acute pain occasioned by eating, evidently attributable to the pressure or traction of the distended stomach; for it subsided as digestion was completed.

The appearance of blood in the urine, in suspected injury of the kidney, does not always follow the infliction of the injury immediately, but on the following day. I have not learned to attach any particular importance to this circumstance. Recurrent hæmorrhage, especially if the blood be fresh and bright in colour, is a more serious sign, as indicating the probable dislodgment of fibrinous plugs in the lacerated vessels; yet these cases may recover. Mr. Hilton has made some interesting and valuable comments, in the volume of the *Guy's Hospital Reports* for last year, on the form which clots assume, as diagnostic of the part from which they are derived. By floating them out in water, he has pointed out that they may be identified as to their source, coagula formed in the bladder being "somewhat irregular in outline, mostly circular flattened masses, bevelled off and fimbriated": they may thus be distinguished from those which form in the pelvis of the kidney, and such as take the tubular cast of the ureter. I think the character of the urine in some of these cases can be explained only by the supposition that clot deposited in the bladder is gradually dissolved in and passed with this excretion.

Rupture of the *spleen*, from contusion or pressure, is not infrequent; and, if extensive, is probably usually fatal from hæmorrhage. Yet, copious bleeding is not a necessary consequence of this injury; for, in

a patient recently under my care, who sustained this and other injuries, and survived for some hours, there was not more than two ounces of blood in the abdomen, though there was an extensive rent in the spleen. In one of my cases, a deep linear cicatrix on the convex surface of the spleen seemed to indicate the position of a former wound, but the patient died of a more recent injury.

I have on record but of one instance of laceration of the *pancreas*, which occurred in a lad who was the subject of other severe internal injuries, which speedily proved fatal. I am not acquainted with any special signs by which these two organic lesions can be identified; unless, indeed, the situation of the pain or the presence of dulness to an abnormal extent in the left hypochondrium, be regarded as suggestive of injury to the spleen.

The rapidity with which the adhesive form of inflammation occurs in injuries of the abdominal viscera, I have seen exemplified in many instances—plastic lymph glueing neighbouring portions of the peritoneum together, when the patients have not survived more than thirty-six, or even more than twenty-four, hours. But this result is very uncertain; and, so far as I have been able to observe, it bears no constant proportion to the acuteness of the symptoms or signs which are evinced during the period which elapses between the receipt of the injury and the death of the patient.

[To be concluded.]

ON THE TREATMENT OF ORGANIC STRICTURE OF THE URETHRA BY RUPTURE.*

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In the following short paper, it is not my intention to enter at any length into the general subject of stricture of the urethra, its pathology, its various forms, and its numerous modes of treatment. My desire is simply to relate my own most recent experience of the use of Holt's dilator, in the management of organic stricture in the various degrees of intensity which are presented to one in hospital and private practice in a great city, such as Glasgow.

It may be said, in a sentence, that few if any affections met with by the surgeon are more distressing than that to which I now allude, and probably none which, in the great majority of instances, is more capable of being relieved, and for which we receive more gratitude when we succeed in putting them right. It is not alone the constant annoyance and anxiety the patient suffers, which render these cases so pressing on the surgeon's attention, but the knowledge that he possesses of their progressive character, and of the disease in bladder, ureters, and kidneys, which will surely in time follow.

I have for years had very ample opportunities of treating stricture in all its forms and phases; and I confess that I have been astonished at its extreme frequency in our large communities, and also how little this frequency is recognised by the profession. Very many of those numerous patients who go from surgeon to surgeon to be treated for "gleet" are examples of more or less decided stricture; and, in its lesser degrees, we constantly encounter it in practice.

I have, in the course of the last few years, tried most of the methods of treating stricture which have been brought before the profession; but of late my experience has been so wholly favourable to Holt's method of rapid dilatation, that it is with a view of adding my mite to its due appreciation and more general adoption, that I have obtruded myself on your notice at this time.

I may, perhaps, at the outset, remark that the few observations I have to make have exclusive reference to organic stricture; and that, while believing firmly in the occasional existence of pure spasmodic stricture, and also of necessity in inflammatory or congestive stricture, yet with these I have at present no concern. Nor do I wish to discuss the various forms in which organic stricture may present itself, nor the necessary precautions required to make certain of its recognition. To consider these points would lead me away from the main subject of my communication; yet I would strongly insist on the importance of using chloroform in examining all difficult cases, and the propriety of commencing with a large sized bougie, and diminishing its calibre till the gauge of the stricture is obtained; as, if we begin with a small size, we may be greatly deceived in our investigation.

I have had no experience of the use of the endoscope for the diagno-

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